

IN THE CLAIMS

Complete listing of the claims:

1. (Original) A laser based coordinate measuring device for measuring a position of a remote target, the measuring device comprising:

a stationary portion having at least a first laser radiation source and at least a first optical detector;

a rotatable portion that is rotatable with respect to the stationary portion; and

at least a first optical fiber system for optically interconnecting the first laser radiation source and the first optical detector with an emission end of the first optical fiber system, the emission end disposed on the rotatable portion for emitting laser radiation to the remote target and for receiving laser radiation reflected from the remote target, wherein an emission direction of the laser radiation is controlled according to the rotation of the rotatable portion.

2. (Previously presented) The laser based coordinate measuring device according to claim 1, wherein the first optical fiber system includes at least first, second, and third optical fibers and a coupler assembly, the first optical fiber for directing light to the rotatable portion from the laser radiation source, the second optical fiber for directing light from the rotatable portion to the optical detector, and the third optical fiber having the emission end and coupled to the first and second optical fibers by the coupler assembly.

3. (Original) The laser based coordinate measuring device according to claim 2, wherein the coupler assembly is disposed on one of the rotatable portion and the stationary portion.

4. (Previously presented) The laser based coordinate measuring device according to claim 1, wherein the laser based coordinate measuring device is structured to determine three dimensions of position and three dimensions of orientation corresponding to the remote target.

5. (Original) The laser based coordinate measuring device according to claim 1, further comprising a second laser radiation source disposed on the stationary portion and a second optical fiber system for optically interconnecting the second laser radiation source and the rotatable portion, a wavelength of second laser radiation source being different than a wavelength of the first laser radiation source.

6. (Original) The laser based coordinate measuring device according to claim 5, further comprising a beam combiner disposed on the rotatable portion for receiving and combining laser radiation emitted from the first and second optical fiber systems into a substantially single composite beam.

7. (Original) The laser based coordinate measuring device according to claim 6, wherein the beam combiner includes at least one beam splitter, the laser radiation from one of the first and second optical fiber systems incident from a first side of the beam splitter and being transmitted through the beam splitter, and the laser radiation from the other one of the first and second optical fiber systems incident from a second side of the beam splitter and being reflected off the beam splitter to become combined with the laser radiation from the first optical fiber system transmitted through the beam splitter.

8. (Original) The laser based coordinate measuring device according to claim 7, wherein the laser radiation reflected from the target is incident from the second side of the beam splitter so as to be split into a first portion having the first wavelength that is transmitted through the beam splitter to the first optical fiber system and a second portion having the second wavelength that is reflected to the second optical fiber system.

9. (Original) The laser based coordinate measuring device according to claim 1, further comprising a beam expander to expand the diameter of a beam including the laser radiation from the first optical fiber system.

10. (Original) The laser based coordinate measuring device according to claim 1, wherein the remote target includes a retroreflector.

11. (Original) The laser based coordinate measuring device according to claim 10, further comprising a position detector for detecting a position of the emitted laser radiation relative to the retroreflector.

12. (Original) The laser based coordinate measuring device according to claim 11, further comprising an actuator for controlling the rotation of the rotatable portion in accordance with a result of the position detector.

13. (Original) The laser based coordinate measuring device according to claim 1, further comprising a first motor disposed to rotate the rotatable portion about a first axis, a first angular encoder to measure the rotation of the rotatable portion about the first axis, a second motor disposed to rotate the rotatable portion about a second axis, and a second angular encoder to measure the rotation of the rotatable portion about the first axis, wherein the first and second axes are substantially orthogonal with respect to each other.

14. (Original) The laser based coordinate measuring device according to claim 13, wherein a first portion of the first optical fiber system is disposed along the first axis and a second portion of the first optical fiber system is disposed along the second axis.

15. (Original) The laser based coordinate measuring device according to claim 14, wherein the first portion allows rotation along the first axis without disturbing signals carried by the fiber system and the second portion allows rotation along the second axis without disturbing signals carried by the first optical fiber system.

16. (Original) The laser based coordinate measuring device according to claim 1, wherein the first optical detector is a part of an absolute distance meter.

17. (Original) The laser based coordinate measuring device according to claim 16, further comprising an incremental distance meter.

18. (Original) The laser based coordinate measuring device according to claim 1, wherein the first optical detector is a part of an incremental distance meter.

19. (Original) The laser based coordinate measuring device according to claim 1, further comprising a locator camera to determine an approximate position of the remote target so that the rotatable portion can be oriented to direct the laser radiation to the remote target.

20. (Original) The laser based coordinate measuring device according to claim 1, further comprising an orientation camera to determine the orientation of the remote target.

21-42. (Cancelled)